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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,770	11/12/2003	Ryoichi Nagayoshi	10873.1355US01	7405
53148 7590 06/27/2007 HAMRE, SCHUMANN, MUELLER & LARSON P.C. P.O. BOX 2902-0902 MINNEAPOLIS, MN 55402			EXAMINER DURNFORD GESZVAIN, DILLON	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/712,770	Applicant(s) NAGAYOSHI ET AL.	
	Examiner Dillon Durnford-Geszvain	Art Unit 2622	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 25-37 is/are rejected.
- 7) ☒ Claim(s) 18-24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/7/04, 4/28/06, 6/28/06</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the eight pixel unit described in claim **17** and the vertical mixing described in claim **17** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim **17** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Although there is clearly support in the specification for the language of claim **17**, specifically a 2X4 group of pixels forming a unit and two pixels adjoining each other in the vertical direction being mixed together in the vertical transfer section. There is discussion as to why this is done or what it is intended to accomplish. In fact, it seems to be directly contrary to the purpose of the invention as it seems that pixels of different colors would be mixed together. Therefore the specification does not contain enough information to enable one of ordinary skill in the art to make the invention described in claim **17** so that it would accomplish the stated goals of the application.

Examination of claim **17** on the merits is precluded.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 are rejected under 35 U.S.C. 102(e) as being anticipated by US  
6,686,960 (Iizuka).

As to claim 1, Iizuka teaches a solid-state image sensing device<sup>1</sup> (see Fig. 4),  
comprising:

vertical transfer parts 4 provided corresponding to respective columns of  
bidimensionally arranged pixels 2 to vertically transfer signal charges read out from the  
pixels; and

a horizontal transfer part 7 for horizontally transferring the signal charges  
received from the vertical transfer parts,

wherein the vertical transfer parts include transfer stages, those located closest  
to the horizontal transfer part being vertical last stages (the part of 4 over the transfer  
gates 6 is the vertical last stages, see Column 8 lines 34-38), and the vertical last  
stages have transfer electrodes formed to have identical configurations repeated every  
m (m denotes an integer of 2 or higher) columns (see Figs. 8 and 9), and

vertical last stages of columns other than one of the m columns or all vertical last  
stages of the m columns each are provided with a transfer electrode that is independent  
of those of other vertical last stages of the m columns so that an operation of  
transferring signal charges from the vertical last stages concerned to the horizontal

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transfer part is controlled independently of said other vertical last stages (Column 8 lines 24-46).

As to claim 2, see the rejection of claim 1 and note that Iizuka further teaches the solid-state image sensing device according to claim 1, wherein the integer  $m$  is  $2n+1$  ( $n$  denotes an integer of 1 or higher) (see Figs. 8 and 9 and note that  $m$  is 3).

As to claim 6, see the rejection of claim 2 and note that Iizuka further teaches the solid-state image sensing device according to claim 2, wherein the vertical last stages located closest to the horizontal transfer part of the vertical transfer parts have transfer electrodes formed to have identical configurations repeated every three columns, and vertical last stages of at least the second and third columns of the three columns, counted as from an output side of the horizontal transfer part, each are provided with a transfer electrode that is independent of those of the other vertical last stages so that an operation of transferring signal charges from the respective vertical last stages concerned to the horizontal transfer part is controlled independently of the other vertical last stages (see Figs. 8 and 9).

As to claim 7, see the rejection of claim 6 and note that Iizuka et al. further teaches the solid-state image sensing device according to claim 6, wherein a vertical last stage of the first column counted as from the output side of the horizontal transfer part has an electrode configuration that is identical to those of stages other than the

vertical last stage of the first column (see Figs. 8 and 9).

As claim **15**, see the rejection of claim **2** and note that lizuka further teaches the solid-state image sensing device according to claim **2**, wherein the bidimensionally arranged pixels are provided with color filters arranged so that four pixels of (two pixels arranged horizontally).times.(two pixels arranged vertically) form one unit (see Fig. 4).

As to claim **16**, see the rejection of claim **15** and note that lizuka further teaches the solid-state image sensing device according to claim **15**, wherein the color filters are arranged so that a first color filter (green) is provided for two pixels, of the four pixels, located on one diagonal line, and second and third color filters (blue and red) are provided for the other two pixels, respectively (see Fig. 4).

As to claim **25**, see the rejection of claim **1** and note that lizuka further teaches the solid state image sensing device according to claim **1**, wherein the vertical transfer parts have at least three layers of electrode films (see Fig. A below), and the transfer electrodes provided independently of those of vertical last stages of the other columns are formed of at least one of layers of electrode films that includes a top layer (see Fig. A below).

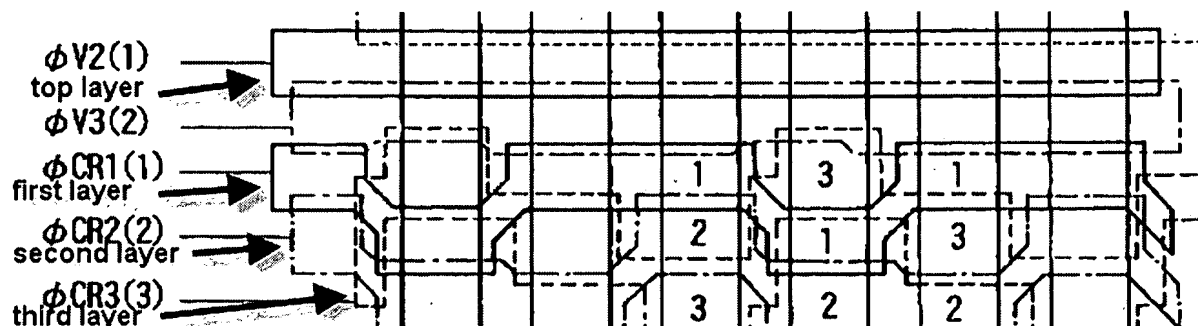


Figure A

As to claim **26**, see the rejection of claim **1** and note that Iizuka further teaches the solid-state image sensing device according to claim **1**, wherein

(e1) signal charges of pixels whose number is between 1 and (m-1) selected from m pixels arranged horizontally are transferred to the horizontal transfer part (see Fig. 14B and note that 1 of 3 pixels, pixels G11, R12 and G13 for example, are transferred to the horizontal transfer part),

(e2) the signal charges present in the horizontal transfer part are transferred in a forward or backward direction by at least a distance corresponding to one pixel (see Fig. 14C), and

(e3) transfer operations e1 and e2 are repeated and thereby all signal charges of the m pixels are transferred to the horizontal transfer part (see Fig. 14D and note that all 3 pixels are read out).

As to claim **27**, see the rejection of claim **26** and note that Iizuka further teaches the solid-state image sensing device according to claim **26**, wherein

(e4) after transfer operation e3, signal charges of all the columns are transferred



toward the horizontal transfer part by one stage (see Fig. 15E),

(e5) signal charges transferred to the vertical last stages by transfer operation e4 are subjected to transfer operations e1 to e3 (see Figs. 15F to 15 H), and transfer operations e4 and e5 are repeated and thereby all signal charges included in m stages are transferred to the horizontal transfer part (see Figs. 14a to 15 H and note that this process is carried out for the entire imager).

As to claim **28**, see the rejection of claim **1** and note that Iizuka further teaches the solid-state image sensing device according to claim **1**, wherein its operation mode can be switched selectively between at least two modes that include a mode of mixing m pixels arranged horizontally by driving transfer electrodes independently of other columns, the transfer electrodes being provided independently of those of the other columns, in vertical last stages of columns other than one of the m columns or of all the columns (this is a mode described in claim **1**), and a mode of carrying out no pixel mixing by driving the transfer electrodes in the same manner as in the other columns (Column 8 lines 24-26 and note that the normal mode is where all pixels are read out).

As to claim **33**, see the rejection of claim **26** and note that Iizuka further teaches the solid-state image sensing device according to claim **26**, wherein the m pixels are arranged consecutively in the horizontal direction (see Fig. 14).

As to claim **34**, see the rejection of claim **26** and note that Iizuka further teaches

the solid-state image sensing device of claim **26**, wherein a combination of the m pixels arranged in the horizontal direction changes stage by stage (see Figs. 14A to 15H).

As to claim **35**, see the rejection of claim **34** and note that Iizuka further teaches the solid-state image sensing device according to claim **34**, wherein in at least two stages adjoining each other, centers of gravity of combinations of the m pixels are spaced equily in the horizontal direction (see Fig. 7).

As to independent claim **36**, see the rejection of claim **1** and note that Iizuka further teaches a camera, comprising a solid-state image sensing device according to claim **1** (see Fig. 23).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims **3** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,686,960 (Iizuka) in view of US 6,423,959 (Ikeda et al.).

As to claim **3**, see the rejection of claim **2** and note that Iizuka further teaches the solid-state image sensing device according to claim **2**, wherein signal charges of pixels included in each of first and second pixel mixture groups are added together in the horizontal transfer part (see Fig. 6 and Column 9 lines 12-16),

where the first pixel mixture groups each are composed of two pixels arranged at every other pixel in a horizontal direction (G11 and G13 of Fig. 6), and

the second pixel mixture groups each are composed of 2 pixels that are arranged at every other pixel and are pixels other than those of the first pixel mixture groups (R14 and R16 of Fig. 6), with centers of gravity of the pixels of the respective second pixel mixture groups each being located at an equal distance from centers of gravity of the pixels of two first pixel mixture groups adjacent thereto (see Fig. 6 and note that this is just a sample of the imager and it goes on to include columns 7 and higher).

Iizuka further teaches that more than three odd numbered pixels may be added (Column 6 line 67 to Column 7 line 1 or Column 21 lines 14-17, for example).

What Iizuka does not explicitly teach is that the first and second pixel mixture groups contain specifically  $2n + 1$  pixels, where  $n$  is an integer greater than or equal to

one. However, Ikeda et al. teaches adding pixels together with groups consisting of  $2n + 1$  pixels (see Fig. 16). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have enlarged the blocks of lizuka so that they would include  $2n + 1$  pixels, such as is done by Ikeda et al. as this would allow for a higher frame rate than what lizuka which would facilitate high speed capture (see Column 16 lines 19-22).

Note that in this combination the blocks depicted in Fig. 6 of lizuka would simply be extended to 5 pixels instead of 3.

As to claim 4, see the rejection of claim 3 and note that lizuka in view of Ikeda et al. further teaches the solid-state image sensing device according to claim 3, wherein with respect to each of the first and second pixel mixture groups present in the vertical last stages,

(a1) only signal charges of pixels located furthest from an output side of the horizontal transfer part in the respective pixel mixture groups each composed of the  $2n+1$  pixels are transferred from the vertical last stages to the horizontal transfer part (see Fig. 14B of lizuka, for example),

(a2) the signal charges present in the horizontal transfer part are transferred in a forward direction by a distance corresponding to two pixels (see Fig. 14C of lizuka),

(a3) only signal charges of pixels that have signal charges remaining in the vertical last stages and are located furthest from the output side of the horizontal transfer part in the respective pixel mixture groups each composed of the  $2n+1$  pixels

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are transferred from the vertical last stages to the horizontal transfer part (see Fig. 14D of Iizuka), and

(a4) transfer operations a2 and a3 are repeated until all signal charges of the pixel mixture groups each composed of  $2n+1$  pixels are transferred from the vertical last stages to the horizontal transfer part (see Fig. 14D).

As to claim 5, see the rejection of claim 4 and note that Iizuka in view of Ikeda et al. further teaches the solid-state image sensing device according to claim 4, wherein further

(b1) as the last operation of transfer operations a1 to a4, signal charges present in the vertical transfer parts of all the columns are transferred to respective next stages after or at the same time a signal charge of the last pixel included in each of the pixel mixture groups each composed of  $2n+1$  pixels is transferred from the vertical last stage to the horizontal transfer part (see Fig. 15F of Iizuka),

(b2) with respect to signal charges transferred to the vertical last stages by transfer operation b1, the transfer operations a1 to a4 are carried out (see Figs. 15G and 15H), and

(b3) transfer operations b1 and b2 are repeated until signal charges included in  $2n+1$  stages are transferred to the horizontal transfer part (see Fig. 15H).

As to claim 8, see the rejection of claim 6 and note that claim 8 corresponds to claim 3 but specifies that  $n = 1$ . Therefore, claim 8 is rejected on the same grounds as

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claim 3 but with  $n = 1$ .

Claim 9 roughly corresponds to claim 4 with  $n = 1$  and therefore, claim 9 is rejected on the same grounds as claim 4 but with  $n = 1$ .

Claim 10 roughly corresponds to claim 5 with  $n = 1$  and therefore, claim 10 is rejected on the same grounds as claim 5 but with  $n = 1$ .

As to claim 11, see the rejection of claim 3 and note that lizuka teaches reading out a 3X3 box and adding the pixels (see Fig. 16). Note that if lizuka were combined with Ikeda et al. as in claim 3 this would be a 5X5 box and 9 pixels would be read out.

As to claim 12, see the rejection of claim 11 and note that lizuka in view of Ikeda et al. would further teach the solid-state image sensing device according to claim 11, wherein the one pixel mixture group is composed of nine pixels arranged in three rows located at every other row in the vertical direction, with three pixels arranged at every other pixel in the horizontal direction being included in each of the three rows (see Fig. 16 of lizuka and note that it would contain 9 pixels if extrapolated to a 5X5 box as discussed in claim 11).

As to claim 14, see the rejection of claim 3 and note that lizuka in view of Ikeda et al. would further teach the solid-state image sensing device according to claim 3,

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wherein one pixel mixture group is composed of three pixels arranged at every other pixel in the horizontal direction in each of rows located at every three rows in the vertical direction (note that the pixel groups are already taught as containing three pixels arranged at every other pixel and there are pixel mixing groups located every third row in a 5X5 box).

As to claim **29**, see the rejection of claim **1** and note that although Iizuka teaches that more than three odd numbered pixels may be added (Column 6 line 67 to Column 7 line 1 or Column 21 lines 14-17, for example), it does not teach that the mode can be switched between the number of pixels to be added.

However, Ikeda teaches three different modes for reading out in movie mode (see Figs. 12-14) where 2, 3 or 4 pixels are mixed. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added at least modes such as those taught by Ikeda et al. to the invention of Iizuka as this would allow for the quantity of light to be effectively increased for performing previewing (Column 15 lines 66-67 of Ikeda et al.).

As to claim **30**, see the rejection of claim **29** and note that Iizuka in view of Ikeda et al. further teaches the solid-state image sensing device according to claim **29**, further comprising color filters of three colors (red green and blue) arranged in a repeated pattern in which among the color filters, those of two out of the three colors are arranged vertically and those of two out of the three colors are arranged horizontally (see Fig. 4 of Iizuka), wherein the operation mode can be switched selectively between

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at least two modes including a mode of mixing  $m_1$  pixels arranged horizontally and a mode of mixing  $m_2$  pixels arranged horizontally, with the  $m_1$  pixels and  $m_2$  pixels being provided with filters having one of the three colors of the color filters, respectively (see Column 6 line 67 to Column 7 line 1 or Column 21 lines 14-17, for example).

As to claim **31**, see the rejection of claim **29** and note that Iizuka in view of Ikeda et al. further teaches the solid-state image sensing device according to claim **29**, further comprising color filters of three colors (red green and blue) arranged in a repeated pattern in which among the color filters, those of two out of the three colors are arranged vertically and those of two out of the three colors are arranged horizontally (see Fig. 4 of Iizuka), wherein the operation mode can be switched selectively between at least two modes selected from a mode of mixing two pixels arranged horizontally, a mode of mixing three pixels arranged horizontally, and a mode of mixing four pixels arranged horizontally, with the two, three, and four pixels being provided with filters having one of the three colors of the color filters, respectively (see the rejection of claim **29** and note that the mixing as is done in Iizuka is done horizontally and thus when combined with Ikeda et al. the mixing of 2, 3 or 4 pixels would be done horizontally).

As to claim **32**, see the rejection of claim **29** and note that Iizuka teaches a mode of mixing no pixels (Column 8 lines 24-26).



9. Claim **13** is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,686,960 (Iizuka) in view of US 6,423,959 (Ikeda et al.) further in view of US 7,199,826 (Uya).

As to claim **13**, see the rejection of claim **3** and note that what neither Iizuka nor Ikeda et al. teach is mixing six pixels in two rows, where three rows are skipped between the two read rows. However, Iizuka in view of Ikeda et al. teaches reading three pixels in a row. Further, Uya teaches a method of mixing pixels where three rows are skipped in-between read rows. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have mixed two of the rows of Iizuka in view of Ikeda et al. resulting in the mixing of six pixels and to have separated the read-out rows by three rows as this would result in an image with six times the sensitivity of an ordinary image that can be read out faster than an ordinary image (see, for example, Column 15 lines 63-67 of Ikeda et al.).

10. Claims **37** and **38** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,686,960 (Iizuka) in view of US 5,436,661 (Yamamoto et al.).

As to claim **37**, see the rejection of claim **33** and note that what Iizuka does not teach is that the camera is a three-plate type camera. However, Yamamoto et al. teaches a three-plate type camera (see Fig. 5). Three-plate type cameras provide several benefits recognized by those of ordinary skill in the art: providing a higher resolution without having to increase the readout speed of the camera by replacing a single imager with three imagers of the same number of pixels each dedicated to a single color, more precise measurement of the luminance of an image by virtue of its having

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twice as many green pixels, and more precise color reproduction, especially among dark colors. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed the camera of lizuka as a three-plate type camera and slightly modified the readout method to conform to a three-plate type camera as this allows for an increase in spatial resolution without increasing the operating speed of the camera.

As to claim **38**, see the rejection of claim **37** and note that lizuka in view of Yamamoto et al. would teach m being set at 2 as lizuka already mixes 2 pixels while dumping the pixel in the middle of a different color (see Fig. 6). lizuka further teaches two modes, one for mixing 4 pixels and one for mixing no pixels (Column 21 lines 14-17 and note that the 3X3 pixel cycle would be a 2x2 pixel cycle if the camera were constructed as a three-plate type camera.

### ***Allowable Subject Matter***

11. Claims **18-24** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: as to claims **18-24**, the cited prior art neither anticipates nor renders obvious the

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claimed limitation of a solid state imaging device as described in claim 6 wherein the vertical last stage is formed of six electrodes with at least two of the electrodes of at least two of every three columns is formed independently from electrodes of the other columns respectively.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dillon Durnford-Geszvain whose telephone number is (571) 272-2829. The examiner can normally be reached on Monday through Friday 8 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on (571) 272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dillon Durnford-Geszvain

6/12/2007

/John M. Villecco/  
Primary Examiner, Art Unit 2622  
June 17, 2007